DOCUMENT RESUME

ED 116 557 HE 006 936

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TITLE	Design of the Preclass Instructional Package for Higher Education.
INSTITUTION	Central Michigan Univ., Mount Pleasant. Inst. for Personal and Career Development.
PUB DATE	Aug 75
NOTE	20p.
AVAILABLE FROM	The Institute for Personal and Career Development, Central Michigan University, Mt. Pleasant, Michigan
EDRS PRICE	MF-$0.76 HC-$1.58 Plus Postage
DESCRIPTORS	Adult Students; Continuing Education Centers; Degree Requirements; *Flexible Schedules; Graduate Students; *Graduate Study; *Higher Education; Instructional Innovation; *Instructional Technology; Part Time Students; *Performance Based Education; Performance Factors; Scheduling

ABSTRACT

The Institute for Personal and Career Development (IPCD) provides graduate level instruction in a number of disciplines to groups of individuals who might otherwise not be able to obtain a graduate education. IPCD attempts to provide an alternate program that meets the needs of these individuals by emphasizing controls which would promote more efficient instruction and learning. These include such controls as (1) the compressed schedule; (2) a mastery of prerequisites; (3) course content; (4) instructional strategies; and (5) evaluation. This document highlights the importance of and methods of achieving the mastery of prerequisites through a specially designed preclass instructional package based on the competency-based model of instruction. The package includes an introduction to the course, instructions to the student, a list of course prerequisites stated as performance objectives, performance objectives for the first unit, a study directory, exercises and problems for the unit, self-assessment test, subsequent units, and a list of classroom activities stated as performance objectives. This package is intended to ensure the instructional effectiveness of the classroom sessions and the post class activities. (JMF)

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ED116557

DESIGN OF

THE PRECLASS INSTRUCTIONAL PACKAGE

FOR HIGHER EDUCATION

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August, 1975

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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The Institute for Personal and Career Development
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HE 006 936

INTRODUCTION

The Institute for Personal and Career Development (IPCD) at Central Michigan University (CMU) provides graduate level instruction in a number of disciplines to groups of individuals who might otherwise not be able to obtain the benefits of a graduate education. Most of the time available to these individuals is taken up by their professional and family responsibilities. In spite of these consuming responsibilities, these people have recognized the need to acquire new skills in order to maintain and further their professional and vocational standing.

For many adults the prospect of returning to school is not entirely pallatable. Most of them are middle aged, and have been out of school for ten, twenty, and even thirty years, and many lack the confidence needed to tackle a traditional graduate program. Evidently, an alternate program must be made available to these individuals.

The Compressed Schedule

An alternate program must attempt to meet the needs of these individuals. The traditional sixteen week semester is not practical since it tends to increase the probability that other personal responsibilities will interfere with classroom attendance. Evenings are not always practical, especially when the classroom is not close to the student. Consequently, an educational system which meets the needs of students must, at the very least, provide a schedule that is convenient for them.

Traditional schedules require that students meet with a professor over a sixteen week period. Day classes normally are fifty minutes in length and are held three days per week. Evening classes are often three hours in length, and still require a sixteen week period. In either case the total amount of student-professor contact time is about 48 hours.

The compressed schedule devised by IPCD, shortens the contact time to thirty-six hours. The scheduling of this time is particularly well suited to the part-time student. In some cases a one week seminar is appropriate; and in other cases the class may be scheduled every two or four weekends. It is apparent that such a compressed schedule could become inefficient, and conceivably, instructionally ineffective if certain principles of learning and instruction are not taken into account. (The application of these principles to an instructional system has normally been termed "instructional development".) In the absence of an intensive instructional development effort the student may not be aware a) of the course objectives, b) of the instructor's expectations in terms of assignments and student performance, c) of any prerequisites that are required for the course and may not even know whether he/she has mastered those prerequisites, and d) of his/her mastery of any preclass assignments. Finally, the educational institution could not determine what the students of a particular course had learned, nor whether instruction was effective.

The implications of these deficiencies are not to be taken lightly. Unaware students may become disgruntled; but more important, the complaint that the course is irrelevant may surface and become epidemic. It is fairly safe to assume that negative attitudes will interfere with learning and instruction.

One may ask whether the Institute should exert control over its classroom instruction to the point that it can identify precisely what has been taught and what has been learned. Perhaps the best way to answer this question is to examine the consequences of a lack of control.

A lack of control implies that two of the essential elements of pedagogy are ignored, and that only lip service is being paid to the third. In the absence of controls, there is no way to adequately (i.e., validly and reliably) determine a) what has been taught, b) what was learned, c) whether instruction was effective, and d) whether an appropriate evaluation of learning and instruction was implemented.

The deleterious consequences of a lack of controls is further complicated by the fact that the Institute's students are heterogeneous with respect to prerequisites, ability to fit into a traditional educational schedule, length of time they have been away from school, and so on.

TYPES OF CONTROLS

A) The Compressed Schedule

One type of control which would promote more efficient instruction and learning has already been discussed. IPCD has developed what it calls a "compressed schedule" which permits students, during time that is convenient to them, to pursue a graduate education. The schedule is not significantly different in total time from a traditional schedule.

B) Mastery of Prerequisites

Another type of control that can help students to master a course, revolves around the necessity to ensure that they come to class as a fairly homogeneous group. Homogeneity in terms of mastery of prerequisites can result in more effective classroom instruction. Consequently, it seems reasonable to provide pre-class instruction which assures such homogeneity.

C) Course Content

Controls over curriculum - what is to be taught - are also essential. It is always difficult to determine exactly what students of the same course which is taught by several professors, have learned. In the Institute's case the problem is confounded by the fact that the courses are taught in scattered locations, and while a syllabus is available, it provides only very general content specifications.

In an effort to ensure that a certain course taught by several different professors provides instruction in specified

concepts and principles, the Institute's efforts have also turned to curriculum development. With the aid of a professor whose academic credentials and teaching experience are concentrated in a specific area, an instructional developer can specify exactly what concepts, principles, and skills are to be taught in a given course.

Goals and performance objectives are developed for the course. These performance statements specify exactly what it is the student will acquire during the instructional activities. By insisting that those objectives be implemented by the professors, the Institute can be assured that students across sections of the same course will be getting instruction in the same concepts and principles.

D) Specifying Instructional Strategies

A fourth source of control over the instruction and learning process is the use of instructional development techniques to design effective programs of instruction. When such techniques are implemented by professionally trained developers, the result is a system of instruction which will promote learning and positive transfer.

E) Evaluation

While development efforts are not always entirely successful on the first attempt, the feedback loops of instructional development ensure that future revisions compensate for prior weaknesses. Evaluation of the efficiency and effectiveness of

learning and instruction requires that instruments be developed not only to assess the extent of student learning, but also the extent to which instruction was appropriate.

Additional details concerning the application of the above controls to a preclass package and to the classroom sessions follow.

THE PRECLASS PACKAGE AND CLASSROOM INSTRUCTION

Instructional development must, of necessity, occupy a central position in the Institute's educational program for graduate students. The primary goal of instructional development is effective and efficient instruction and learning. Toward that end it must maintain control over a number of elements involved in the educational processes.

As indicated earlier, one of the controls that has been instituted is the compressed schedule. Scheduling is a variable that primarily affects efficiency, therefore, the use of a preclass package and the exercise of the various controls of instructional development over both that package and classroom instruction will be implemented in order to provide for the effectiveness of the Institute's educational program. It is also important for the Institute to control the traditional heterogeneous character of its classes. It becomes a very difficult task for the instructor to provide effective instruction when he must take into account the usual lack of prerequisite skills which characterize students, and at the same time consider the variety of needs, abilities and so on, of those students.

Most courses of instruction will require that students possess prerequisite skills. In some cases these prerequisites may be satisfied by the completion of another course. In other cases, the number of prerequisites may be minimal but no less important in contributing to the student's successful completion

of the course. Very often the limited number of prerequisites comprises only a small portion of another course and it would be inefficient to require that a student complete that course.

A more efficient approach is to carefully analyze the course's content and to specify its prerequisites in the form of behavioral objectives. A self-test would then be developed based on the objectives. Students could take the test and determine for themselves which prerequisites they have already acquired. A self-instructional component of the preclass package would enable students to overcome any deficiencies.

More effective classroom instruction will result when a preclass package provides students with the opportunity to acquire concepts and principles that can be applied to the classroom's instructional activities. Very often, instructors must provide instruction in basic concepts and principles without being able to devote adequate attention to those instructional activities which promote positive transfer. These activities involve the use of case studies, problem solving, simulations, and role playing. Such activities by virtue of their relationship with real problems, ensure that positive transfer will occur: they require the student to apply concepts, principles and problem solving techniques to problems that may be encountered outside the classroom.

DESIGN OF THE PRECLASS PACKAGE

The preclass package will be based on the competency based model of instruction. This model relies on the specification of competencies which are to be mastered by the students. In order to assure that such mastery takes place, instructional development practices must be stringently applied to the design of the materials. Revisions which are a consequent of an orthodox evaluation plan can further assure that 85 percent of the students who participate in the package, will attain a score of 80 percent on the examination.

The elements which comprise the preclass package include the following:

a) Introduction to the course (a general description of content)

b) Instructions to the student including

   i) an explanation of self-instructional materials
   ii) a study map describing the sequence of instruction
   iii) grading policies specific to the course
   iv) a suggested study schedule
   v) what to do if the student needs help

c) A list of course prerequisites stated as performance objectives. This section will also include a self-assessment test which will enable the student to determine if she/he has acquired those prerequisites, and assignments which will enable the student to acquire those prerequisites he/she may not already possess. (When an entire course acts as a prerequisite, students who have not taken that prerequisite will not be permitted to enroll in the superordinate course.) Not all courses will have prerequisites.

d) Performance objectives for the first unit

e) A study directory which indicates those textbook readings, exercises, problems, and self-assessment test items which must be completed for each objective.

f) Exercises and problems for the unit

g) Self-assessment test for the unit (and its key)

h) Subsequent units

i) A list of classroom activities stated as performance objectives

In order for these materials to be of greatest value, the instruction they provide must be coordinated with that provided during the classroom sessions. One source of coordination will be an examination which the students must take prior to the classroom sessions. This examination will be based on the objectives and instructional assignments contained in the preclass materials. Mastery of the exam will be necessary if the subsequent instruction is to be effective. Students will be required to attain a minimum score of 80 percent on that examination. A student who does not achieve that level of mastery, may be asked to discontinue his participation in the class.

All materials, including the preclass instructional study guide and all required textbooks, will be boxed and mailed to the student well in advance of the classroom sessions. The Institute will provide other administrative information, such as a description of IPCD, the course schedule, grading policies, information about the professor, and so on. This latter information will not be a part of the preclass materials, but will

be mailed to the student separately, and well in advance of the classroom sessions.

PRECLASS AND CLASSROOM OBJECTIVES

The group setting of the classroom is highly conducive to those instructional activities which can act to confirm and consolidate what the student has learned from the preclass materials. Further, more complex problems can be presented and their solutions attempted through the use of group discussion, problem solving, simulation, role playing, and lecture. Thus, classroom instruction should not attempt to provide instruction primarily in those concepts which can be effectively acquired through the use of self-instructional materials, but rather should attempt to challenge the student's knowledge and ensure that what has been learned can be transferred to the complex problems of reality.

To summarize, the classroom sessions will act to a) provide for the reinforcement or confirmation of what has been learned, b) enable the students to consolidate and synthesize what has been learned from the preclass package, c) enable the students to evaluate their own and the solutions of other students to relevant problems, d) ensure that what the student has learned is transferred to the complex problems of reality, and e) provide instruction, through a variety of strategies, related to additional and often more complex principles.

This is not to imply that higher order learning activities (e.g. problem solving) will be absent from the preclass materials. Certainly, their use is required to ensure instructional

effectiveness. However, because of the time constraints, the use of very complex problems must be avoided. The types of problems that can effectively be included are those whose solutions are singular (very often some problems may be resolved in several ways). Furthermore, complex problems which often have multiple acceptable solutions can more efficiently and effectively be presented and treated during the classroom sessions. The presence of other students and an experienced professor can provide the cues which stimulate the recall of appropriate concepts and principles necessary for the problem's solution, and can further serve as reinforcing agents.

Representative generic objectives - that is, objectives to which a variety of the discipline's content can be fitted - are included in the list below. While suggested instructional strategies are not included here, they would appear in an instructor's manual. Since the mastery model would be applied to classroom instruction, criterion referenced examination items would also be developed for each objective.

1. Given a problem or case study (...fit description here...) the student will select the one correct solution from a list of solutions, and will select from another list, the specific concepts and principles that contribute to the selected solution.

2. Given a problem or case study (...fit description here...) and its solution which may be correct, incorrect, or partially correct

   a) discuss in a group of five to six students the adequacy of the solution,

b) present to the class, reasons or criteria which support your evaluation of the solution, and

c) if appropriate, suggest an alternate solution with reasons indicating its superiority over the given solution.

These two objectives represent superordinate skills that can be practiced during the classroom session provided that the prerequisite concepts have already been acquired. Logically, instruction related to those two objectives would first be based on those concepts and principles acquired from instruction provided in the preclass materials.

It is only reasonable to expect that some new concepts and principles be presented during the classroom sessions. Their acquisition would be followed by activities, implied by objective 1 and 2 that provide for a maximum of positive transfer to problems encountered on the job. Objectives 3, and 4 below reflect, again in a generic fashion, the instructional and evaluative characteristics of the classroom sessions. Objectives 1 and 2 imply problem solving skills (if one is an adherent of Gagne) and evaluation skills (if one is an adherent of Bloom and Krathwohl), objectives 3 and 4 reflect concept and principle learning (one is somewhat at a loss to find parallel classifications in Bloom and Krathwohl's taxonomy).

3. Concepts a) Given a term, select from a list of cases the one(s) which constitute an example of the application of the term.

b) Given a number of examples, select from a list the term (concept label) that represents each. (The list of terms should be supplied)

4. Principles

a) Given the name of a rule or principle, select from a number of statements, the one which correctly describes the relationships among the various components (concepts and possibly other principles) of the rule. (The rules should be named.)

b) Given a rule or principle select from a list the problem whose solution depends upon the application of the rule. (The rules should be supplied.)

c) Given a case or problem, select from one list its solution, and from another list the principles that were applied in arriving at the solution. (The types of cases should be described.)

THE POSTCLASS ASSIGNMENT

The argument may be made for the assignment of a problem which would require the student to consider an even larger number of concepts and principles than those problems and activities reflected in the above objectives. When appropriate to the discipline, it may be instructionally effective to require the student to, for example, detail the ways in which what he has learned can be used in, or will influence, his vocation or life-style. If that is too esoteric, a lengthy case study involving many problems, and which can only be answered after numerous hours of thought and study can be assigned as a final examination.

This latter type of open book, unsupervised, examination is not easily graded and its reliability may be too low unless the manner in which the student develops an answer is specified. Thus, the directions may require the student to a) explain the problem by listing its components, b) list a number of principles that may contribute toward a solution, c) explain the contribution of each principle to the solution, d) suggest a solution as a set of recommendations for solving the problem.

SUMMARY OF THE PRECLASS, CLASS AND POSTCLASS ACTIVITIES

The sequence of instruction suggested in this paper are hierarchical in nature, requiring the mastery of subordinate elements before attempting the superordinate elements. Further, each instructional component is designed to promote positive transfer both to superordinate components of the hierarchy and to the problems encountered in reality. In order for such an instructional sequence to meet its full potential, all activities must be coordinated, and developed by instructional designers.

It should be emphasized that no attempt is being made tc constrain the professor, nor is his ability being questioned. The Institute, however, is interested in delivering the best possible instruction to its students. To maintain its integrity as an educational organization, the Institute must be able to exert a degree of control over the quality of education it provides.

The preclass and class sessions rely heavily on the mastery model, which in turn relies heavily on the competency based model. These models and the philosophy dictated in instructional development assume that within certain limits, the responsibility for student failure lies not with the student, but rather with the instructional process.

The plan contained in this report is sound. It is based on the successes of contemporary models of instruction and it relies on the application of instructional technology to the development

of instructional materials. Its implementation would not be inexpensive, but when it is amortized over time and student population, the expense will be cost effective.

Implementation requires the services of a number of professionals including instructional developers, an evaluation expert, professors willing to adapt to the system, and an administrative organization devoted and committed to the system.

The Institute for Personal and Career Development fulfills these requirements and has acquired the experience with the use of self-instructional packages and group instruction to fully develop and implement such a system. At present only a handful of preclass packages can be developed. Further development will be based on their instructional effectiveness and efficiency and the lessons we will learn from their implementation.

The Institute will play the role of the proverbial turtle: we will proceed slowly, with caution, and we will be certain of every step: the goal will be worth the race. If education can be extended efficiently and effectively, to individuals who might otherwise not be beneficiaries of higher education, a significant societal need will have been filled.